In the Specification:

Please replace the paragraph located on Page 1, first paragraph immediately following "Background of the Invention" with the following amended paragraph:

The present application is related to U.S. Patent Application Serial No. [[____________]] 09/675,487, entitled "HIGH GAIN DETECTOR AMPLIFIER WITH ENHANCED DYNAMIC RANGE FOR SINGLE PHOTON READ-OUT OF PHOTODETECTORS", ~~attorney docket number 24096.00300/00SC003,~~ filed September 29, 2000; and is also related to U.S. Patent ~~Application Serial~~ No. [[____________]] 6,504,141, entitled "ADAPTIVE AMPLIFIER CIRCUIT WITH ENHANCED DYNAMIC RANGE"; ~~attorney docket number 24096.00900/99SC026, filed September 29, 2000,~~ the disclosures of which are herein incorporated by reference.

Please replace the paragraph found at Page 10, line 12 – Page 12, line 8 with the following amended paragraph:

Each FPA is comprised of an array of such pixels. The maximum FPA output voltage swing will be limited by the range of charges integrated in the various pixels. The maximum total swing can be directly expressed as:

$$V_{MAXOUT} = 5\frac{\Delta Q_{\text{int}}}{C_{\text{int}}}$$

where $5\Delta Q_{\text{int}}$ is the total range (for 99% of the pixels) of residual integrated charge after skimming. Further,

$$\Delta Q_{\text{int}} = t_{int}\Delta\left\{I\left(1-e^{\frac{-V_{skim}}{V_T}}\right)\right\}$$

where t_{int} is the integration time, I is the photodiode current, V_{skim} is the gate voltage on the skimming FET Q21 (above threshold), V_T is the thermal voltage and Δ represents variation. The variation in the net integrated current simplifies to:

$$\Delta\left\{I\left(1-e^{\frac{-V_{skim}}{V_T}}\right)\right\} = \left\{\Delta I\left(1-e^{\frac{-V_{skim}}{V_T}}\right)^2 + \left(I\frac{\Delta V_{skim}}{V_T}\right)^2\right\}^{1/2}$$

$$= \left\{\Delta I\left(\frac{V_{skim}}{V_T}\right)^2 + \left(I\frac{\Delta V_{skim}}{V_T}\right)^2\right\}^{1/2}$$

because the first term that would otherwise appear in braces is eliminated by the adaptive circuit. The variation in the skim voltage in the preceding expression is:

$$\Delta V_{skim} = \left[\frac{kTC_{IkTC}}{\left(C_{program}+C_{trim}\right)^2} + 2q\frac{It_{skim,\text{int}}C^2_{IkTC}}{C^2_{skim,\text{int}}\left(C_{program}+C_{trim}\right)^2}\right]^{1/2}$$

The first term in the braces is the programming error due to kTC noise and may be further reduced by a feedback-enhanced technique known as tapered reset, as disclosed in U.S. Patent ~~Application Serial~~ Number ~~09/057,423~~ 6,697,111[[,]] ~~(assignee docket number 97SC087),~~ entitled "COMPACT LOW-NOISE ACTIVE PIXEL SENSOR WITH PROGRESSIVE ROW RESET" filed on April 8, 1998, the

disclosure of which is herein incorporated by reference. The second term is shot noise due to the charging currents in the reset procedure. The term $t_{skim,int}$ is the time used to integrate the charge to establish the skim voltage on the skim transistor. The term $C_{skim,int}$ is the amalgamated capacitor on which this charge is integrated and on which the skim voltage is established prior to isolating the skim FET. It is clear that it helps to make $C_{skim,int}$ as large as possible to achieve the smallest error in the programming voltage, V_{skim}. However, the kTC isolation capacitor C_{IkTC} also reduces this noise substantially. Proper setting of the intial voltage conditions can allow $It_{skim,int}$ to approach the maximum integrable charge on C_{int}. If we assume this is 10^7 charges and we wish to integrate 10^9 charges (99%), we need to be sure that ΔV_{skim} is less than 0.2% of the thermal voltage, or about 14μV at 80K. We can illustrate the significance of these terms by assuming reasonable capacitance values for a small (~313μm^2) unit cell. Taking C_{int} = 750fF, $C_{program}$ = 100fF and C_{trim} and C_{IkTC} both = 10fF, the right hand term would give 87μV—a bit large for the target skim fraction. The left hand term would give 30μV. Optimizing the cell (within current design rules) by sizing $C_{program} + C_{trim} = C_{int}$ and making C_{IkTC} as small as possible in current design rules we would have $C_{int} = 430$fF and $C_{IkTC} = 5$fF with the result that the kTC noise is only 5.5 μV and the shot noise is 19.3μV, very near the desired target.